UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/581,385	08/16/2006	Gerald Hohenbichler	P/3240-113	3884

2352 7590 05/26/2009
OSTROLENK FABER GERB & SOFFEN
1180 AVENUE OF THE AMERICAS
NEW YORK, NY 100368403

EXAMINER	
HEVEY, JOHN A	
ART UNIT	PAPER NUMBER
1793	
MAIL DATE	DELIVERY MODE
05/26/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/581,385	HOHENBICHLER ET AL.	
	Examiner	Art Unit	
	JOHN A. HEVEY	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _17 February 2009_.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-26_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-26_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of Application

Claims 21-26 are new. Claims 1-26 are pending and presented for examination.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1-2, 6-15, 18-24, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wright (EP0887129, as cited on IDS).

In regards to claims 1 and 22-24, Wright teaches a method of sequence casting for the continuous production of metal strips, slabs, or other forms, wherein molten metal is fed from a ladle (melt vessel) to a tundish and from the tundish to a mold (see col 1, ln 43-51) wherein during the change-over from one ladle to the next an interruption of the inflow into the tundish occurs and upon

resumption of the supply the inflow rate of molten metal from the ladle to the tundish is 1.5 times the casting flow (outflow) or greater (see col 2, ln 8-19) thus overlapping with the instantly claimed range. It would have been obvious to one of ordinary skill in the art to select from the portion of the overlapping ranges, in order to enhance casting efficiency while minimizing cast defects. Overlapping ranges have been held to establish prima facie obviousness (see MPEP 2144.05). Wright teaches a "quasi-steady" bath level via the use of a tilting tundish mechanism (see Figure 3). The reference is interpreted to teach said inflow and outflow rates for substantially the entire refilling process, reading on the instantly claimed ranges.

In the alternative, Wright establishes that the inflow and outflow rates are result effective variables (see column 5, lines 11-41). It would have been obvious to one of ordinary skill in the art at the time the invention was made to choose the instantly claimed ranges through process optimization, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. One of ordinary skill in the art would appreciate the need to optimize the time period of increased inflow versus outflow in order to effectively fill the tundish and return to quasi-steady state flow operation. One would have been motivated to do so in order to minimize variation and contaminants in the cast metal and to maximize industrial applicability of the invention.

In regards to claim 2, Wright teaches an inflow rate which is 1.5 or more time greater than the outflow rate (see above) which corresponds to the “maximum inflow rate during steady-state casting” wherein the inflow and outflow rates are equal, and thus reads on the instant claim.

In regards to claim 6, Wright teaches that the supply of molten metal into the tundish is interrupted while a constant head level and casting rate is maintained (see col 2, ln 31-36), deemed equivalent to the instant claim.

In regards to claim 7 and 26, the reference differs in that it does not disclose the interruption times as required by the instant claims. However, Wright establishes that the timing of the interruption is a result effective variable (see col 4, ln 2-10). It would have been obvious to one of ordinary skill in the art at the time the invention was made to choose the instantly claimed ranges through process optimization, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. One would have been motivated to do so in order to minimize variation and contaminants in the cast metal and to maximize industrial applicability of the invention.

In regards to claim 8, Wright teaches the use of tundish powders (see col 7, ln 23-31) in order to protect the metal from oxidation, deemed equivalent to the instant claim.

In regards to claims 9-10 and 14, Wright teaches the use of control valves on the melt vessel, control of the tundish utilizing mass sensing and/or level

sensing (see col 7, ln 13-15) and further teaches that the inflow of molten metal into the tundish relative to the outflow (discharge) is a result effective variable. It would have been obvious to one of ordinary skill in the art to control the supply of metal and bath level in view of the teaching of Wright in order to maintain the quality of the cast metal, increase efficiency, and enhance the industrial applicability of the method.

In regards to claim 11, Wright teaches the casting of a steel strip on a two roller casting machine (see Figure 1) and teaches flow rates of metal between 5-150 tons/hour (see col 3, ln 20-21) which overlap with the instantly claimed ranges. It would have been obvious to one of ordinary skill in the art to select from the portion of the overlapping ranges, in order to enhance efficiency while minimizing cast defects. Overlapping ranges have been held to establish prima facie obviousness (see MPEP 2144.05).

In regards to claims 12-13, Wright teaches the use of tundish powders (equivalent to covering agent) in an area with low turbulence (see col 7, ln 23-31).

In regards to claim 15, Wright teaches the use of a divider plate (see Figure 3) which divides a tundish into two partial quantities, where molten metal is fed from a ladle to the first partial quantity, continuously transferred to the second partial quantitiy, and teaches where the inflow to the first quantity (inflow from ladle) is 1.5 times or greater the outflow from the second partial quantity (casting outflow)(see above) thus overlapping with the instantly claimed range. It

would have been obvious to one of ordinary skill in the art to select from the portion of the overlapping ranges, in order to enhance casting efficiency while minimizing cast defects. Overlapping ranges have been held to establish prima facie obviousness (see MPEP 2144.05).

In regards to claims 18-19, Wright teaches a divider plate dividing a tundish into two quantities with an opening (free space) between the divider plate and the base of the tundish (see Figure 3).

In regards to claim 20, Wright teaches the use of control valves on the melt vessel, control of the tundish utilizing mass sensing and/or level sensing (see col 7, ln 13-15) and further teaches that the inflow of molten metal into the tundish relative to the outflow (discharge) is a result effective variable. It would have been obvious to one of ordinary skill in the art to control the supply of metal into the tundish as a function of the outflow of metal from the tundish in view of the teaching of Wright in order to maintain the quality of the cast metal, increase efficiency, and enhance the industrial applicability of the method.

In regards to claim 21, Wright teaches the use of steel (see col 4, ln 37-40).

4. Claims 3-5, 16-17, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wright as applied to claims 1 and 15 above, and further in view of Melville et al. (US5887647, as cited on IDS).

In regards to the instant claims, Wright does not specifically teach a reduced inflow rate during the last 5-30% of the period from the resumption of the supply of metal until a steady-state operating level or a maximum inflow rate occurring during the first .1-30% of the period from the resumption of the supply of metal until a steady-state operating level.

Melville et al. teaches a sequence casting process in which during the change from one ladle (melt vessel) to the next, a decreased outflow from the tundish and casting rate are used (see col 5, 23-31).

Although the references do not specifically discuss a reduced inflow rate as required by the instant claims, the references teach that the speed of inflow in relation to outflow and casting rate is a result effective variable which effects the quality of the cast metal strip. Thus, the particular ranges cited, regarding decreased or reduced inflow rates, are a matter of design choice and routine optimization. It would have been obvious to one of ordinary skill in the art to optimize the inflow rate through routine optimization in order to balance the efficiency and throughput of the process with product quality.

Response to Arguments

5. Applicant's arguments filed 2/17/2009 have been fully considered but they are not persuasive.

6. The applicant argues that Wright fails to teach a relationship between an inflow rate and a “first period of time” as defined by claim 1, and therefore fails to meet the

requirement of claim 1. This is not found persuasive. The first period of time is defined as the "time starting from a resumption of the feeding of the metal melt into the tundish until a point at which a quasi-steady state operation bath level in the tundish is reached" and claim 1 further requires the inflow during said time period to be less than or equal to double the outflow rate from the tundish.

7. Wright teaches a method of sequence casting wherein during the change-over from one ladle to the next an interruption of the inflow into the tundish occurs and upon resumption of the supply the inflow rate of molten metal from the ladle to the tundish is 1.5 times the casting flow (outflow) or greater (see col 2, ln 8-19) thus overlapping with the instantly claimed range. Wright teaches a "quasi-steady" bath level via the use of a tilting tundish mechanism (see Figure 3). Wright further establishes that the inflow and outflow rates are result effective variables (see column 5, lines 11-41). It would have been obvious to one of ordinary skill in the art at the time the invention was made to choose the instantly claimed ranges through process optimization, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. One of ordinary skill in the art would appreciate the need to optimize the time period of increased inflow versus outflow in order to effectively fill the tundish and return to quasi-steady state flow operation. One would have been motivated to do so in order to minimize variation and contaminants in the cast metal and to maximize industrial applicability of the invention.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOHN A. HEVEY whose telephone number is (571)270-3594. The examiner can normally be reached on Monday - Friday 8:00 AM to 5:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jessica Ward can be reached on 571-272-1223. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. A. H./
Examiner, Art Unit 1793

/Kevin P. Kerns/
Primary Examiner, Art Unit 1793